Can Environmental Sustainability be Factored into DoD Acquisition Programs?

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Report Documentation Page

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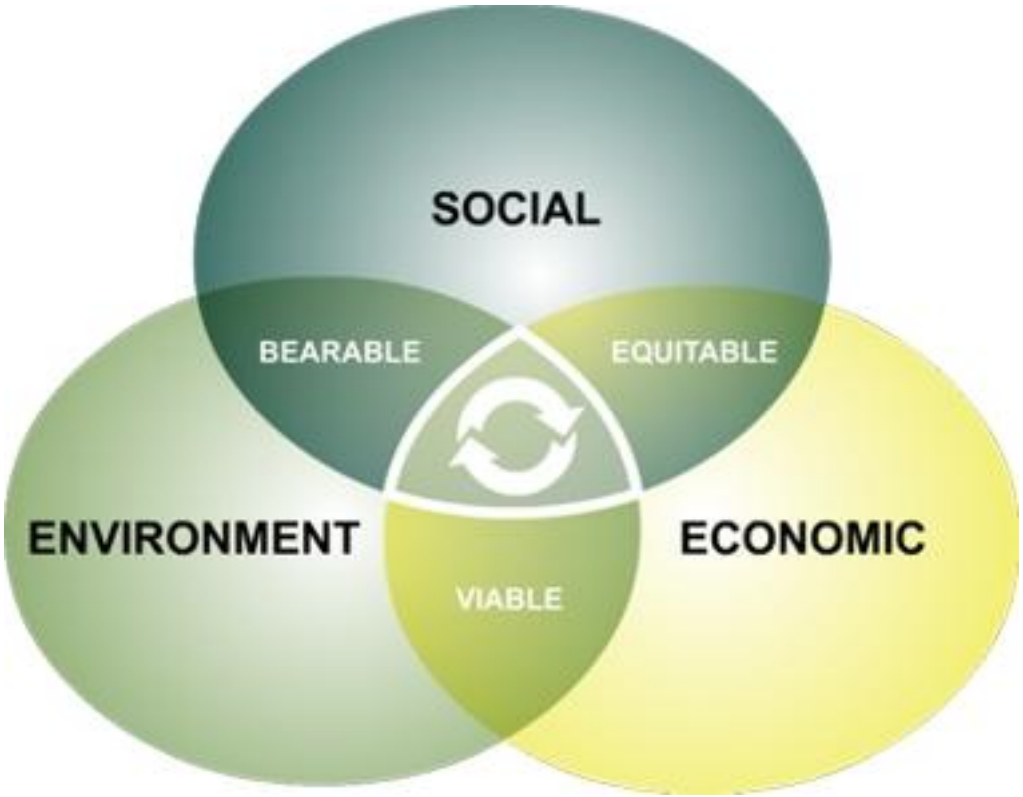
Sustainability



Sustainability is seen as a durable and self sufficient balance between social, economical and environmental factors

Example Sustainability Factors

Chemicals & Materials Use

Energy Use

Food Production

Greenhouse Gas Emissions

Air Pollutants

Population Rate

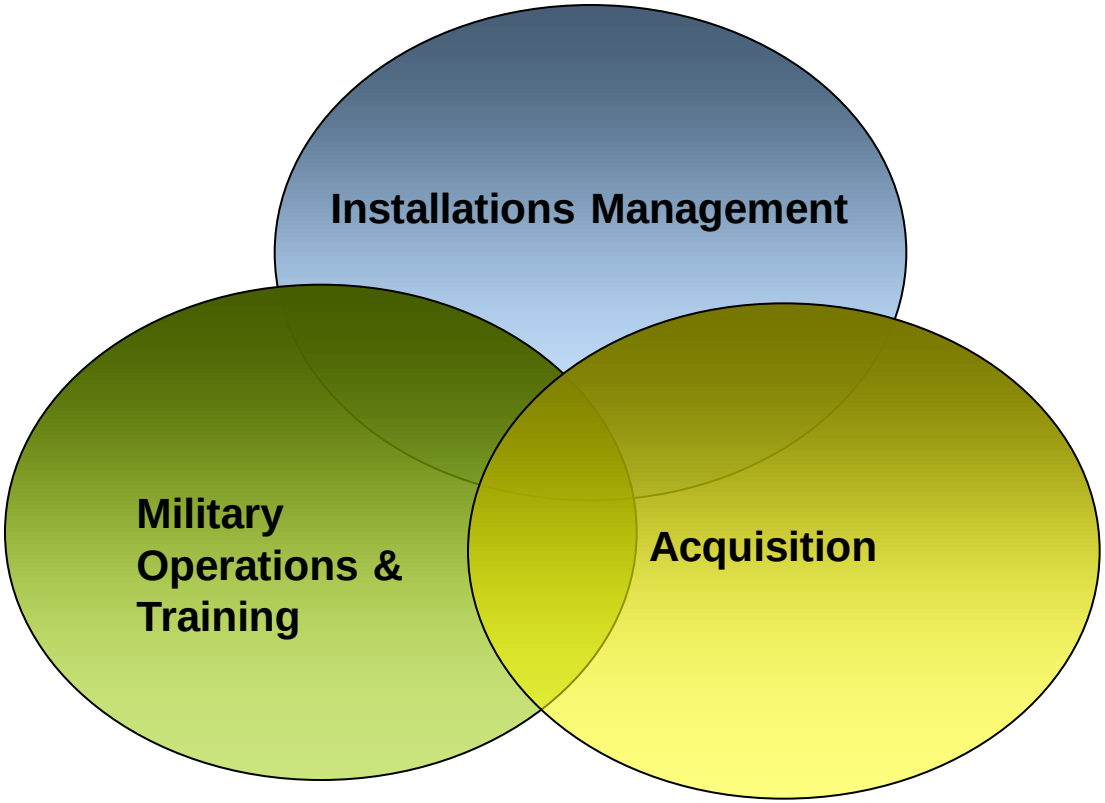
Water Use

Waste Production

Habitat Protection

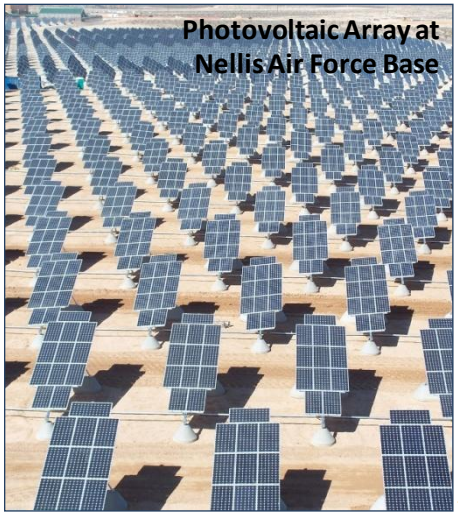
Land Use

An Idea - DoD Sustainability Sectors



DoD Sustainability Examples

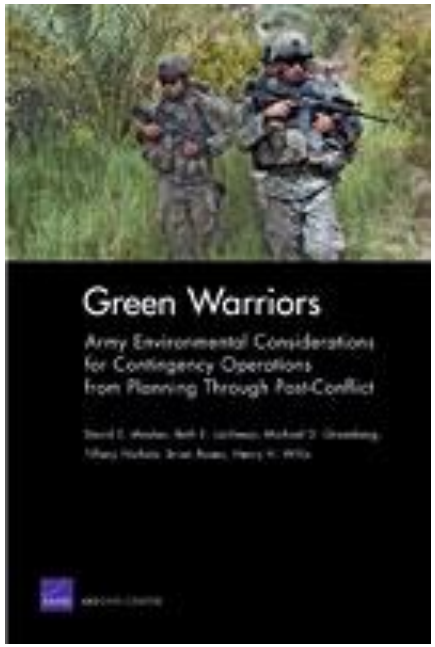
Gold LEED-Certified Air Force Weather Agency Headquarters Building, Offutt AFB, NE

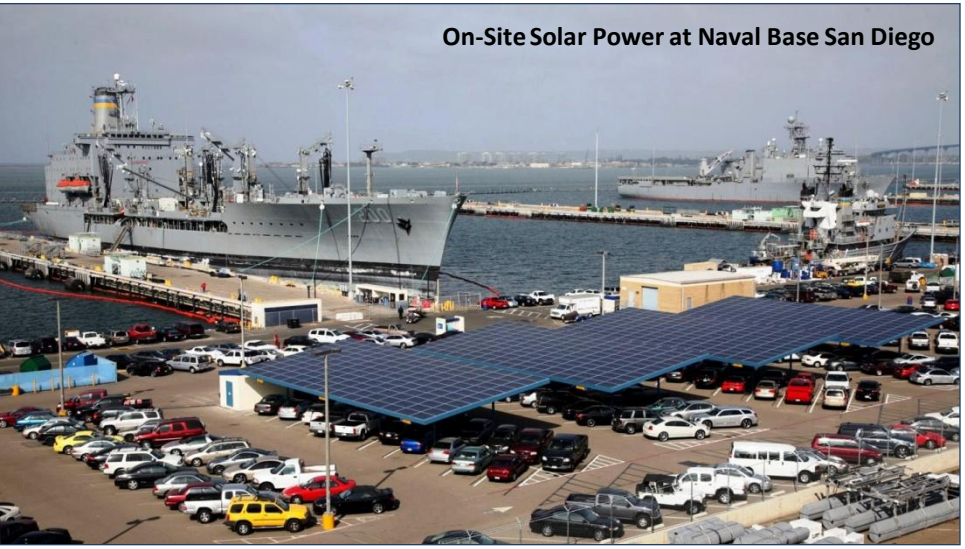


Photovoltaic Array at Nellis Air Force Base

Photo: U.S. Air Force

Photo: U.S. Air Force





On-Site Solar Power at Naval Base San Diego

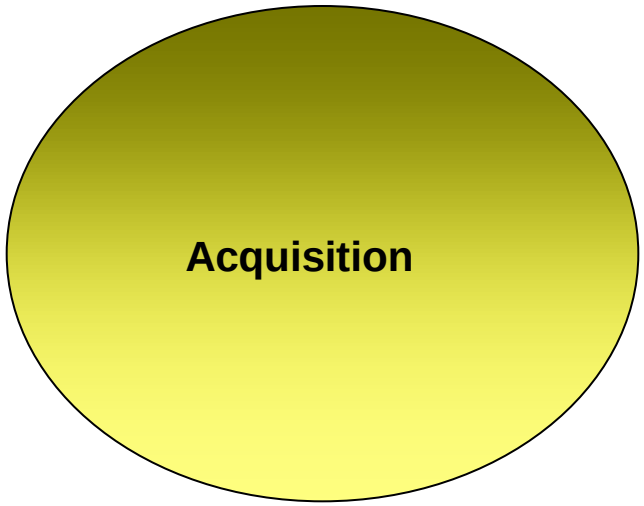
Photo: U.S. Navy

Photo: U.S. Air Force

Non-Chrome Primer

Photo: U.S. Army

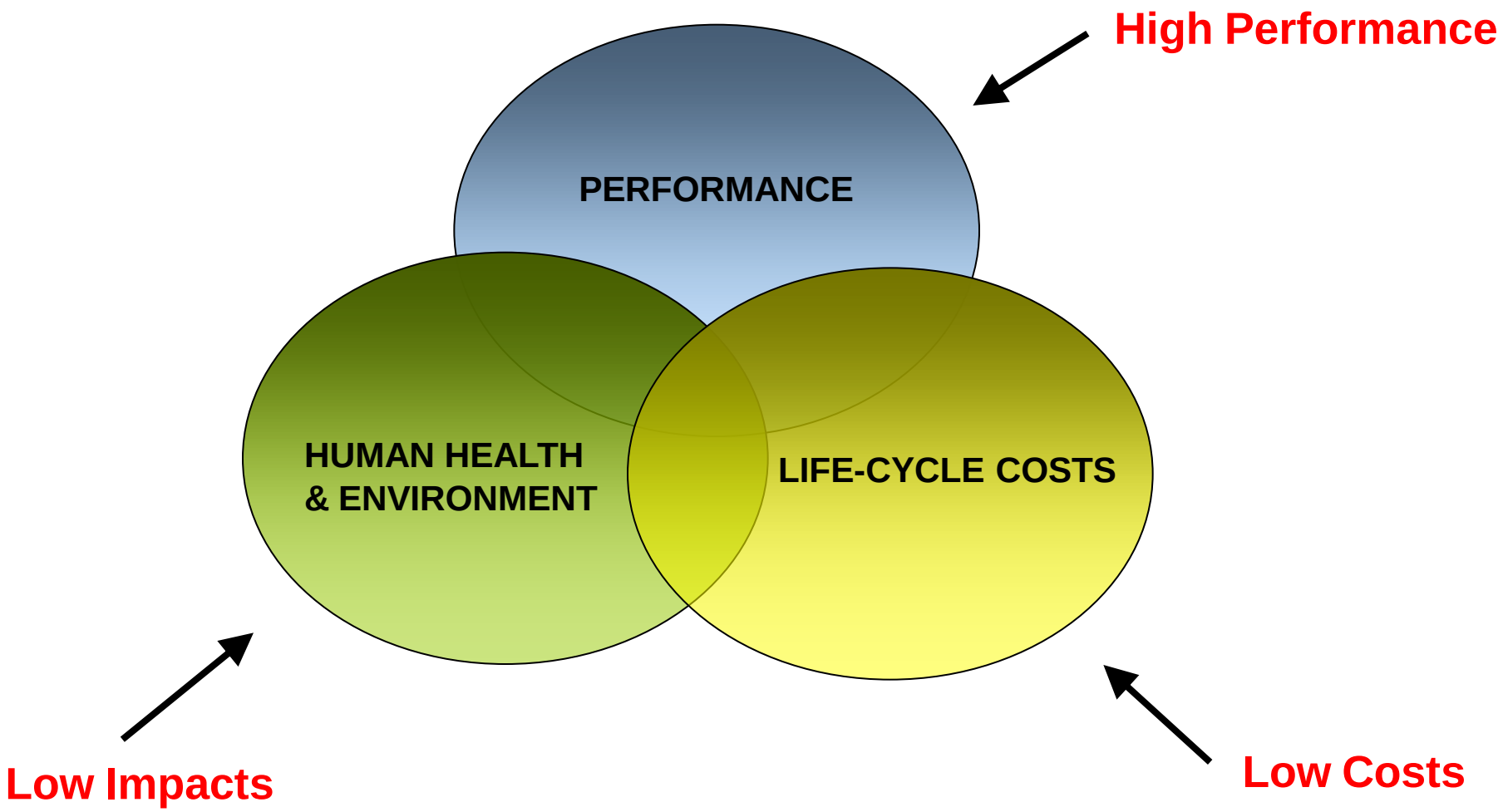
Focus on Acquisition Sustainability



Sustainability in DoD Acquisition

From Development through Disposal

Acquisition, Technology and Logistics



Sustainability in DoD Acquisition

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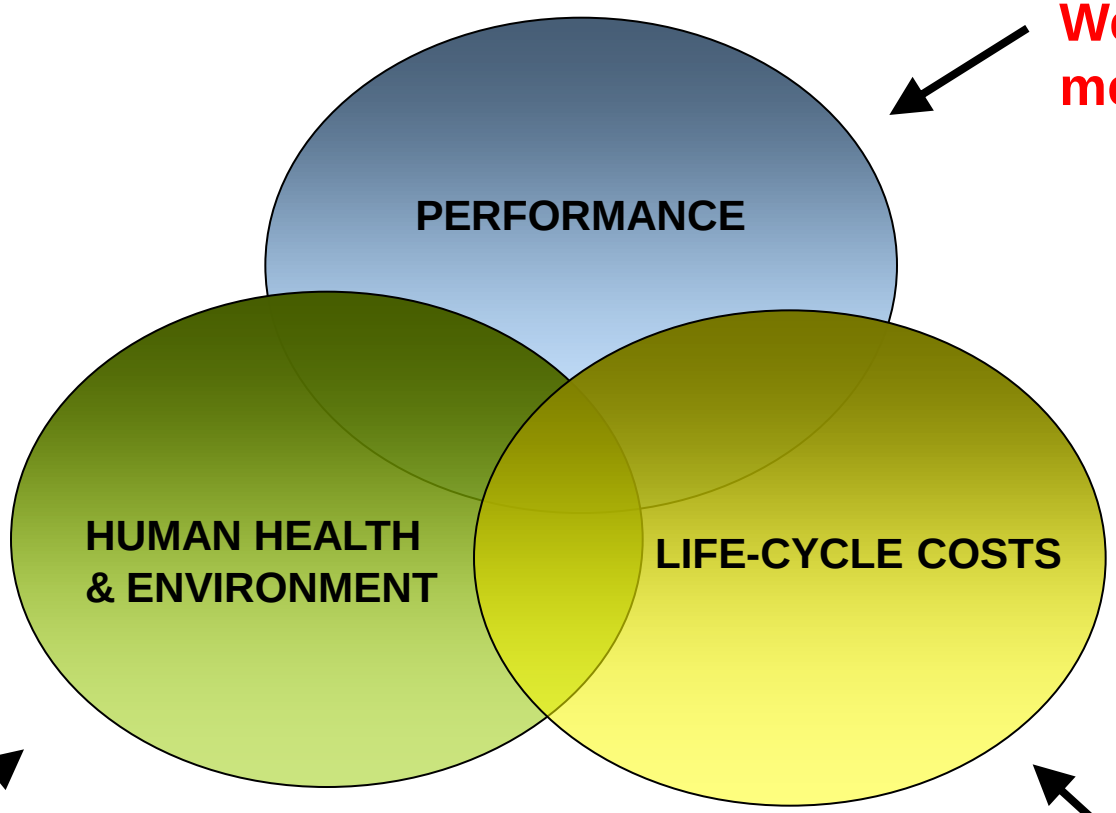
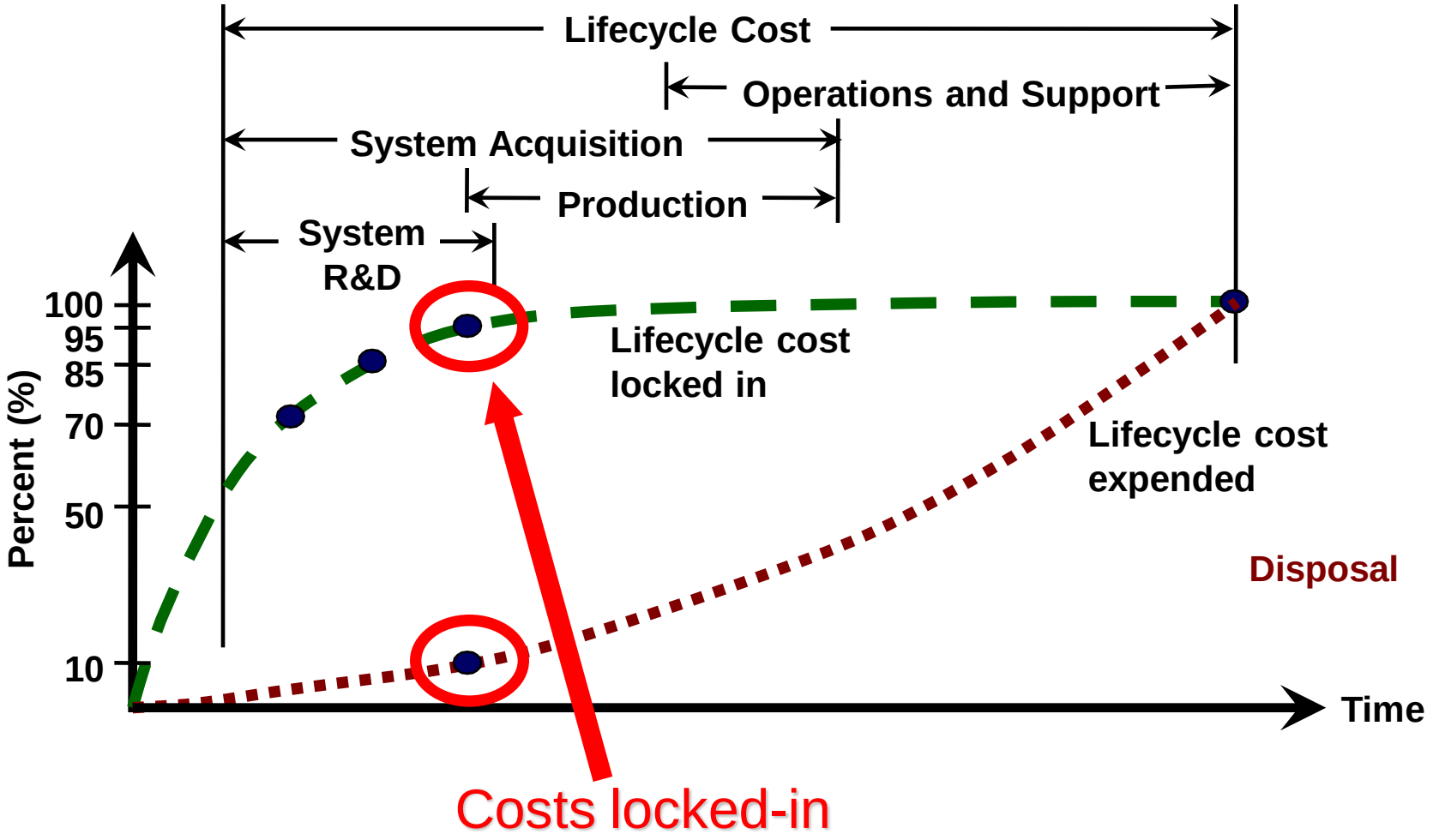


We can test & measure this

We need some criteria to weigh alternatives

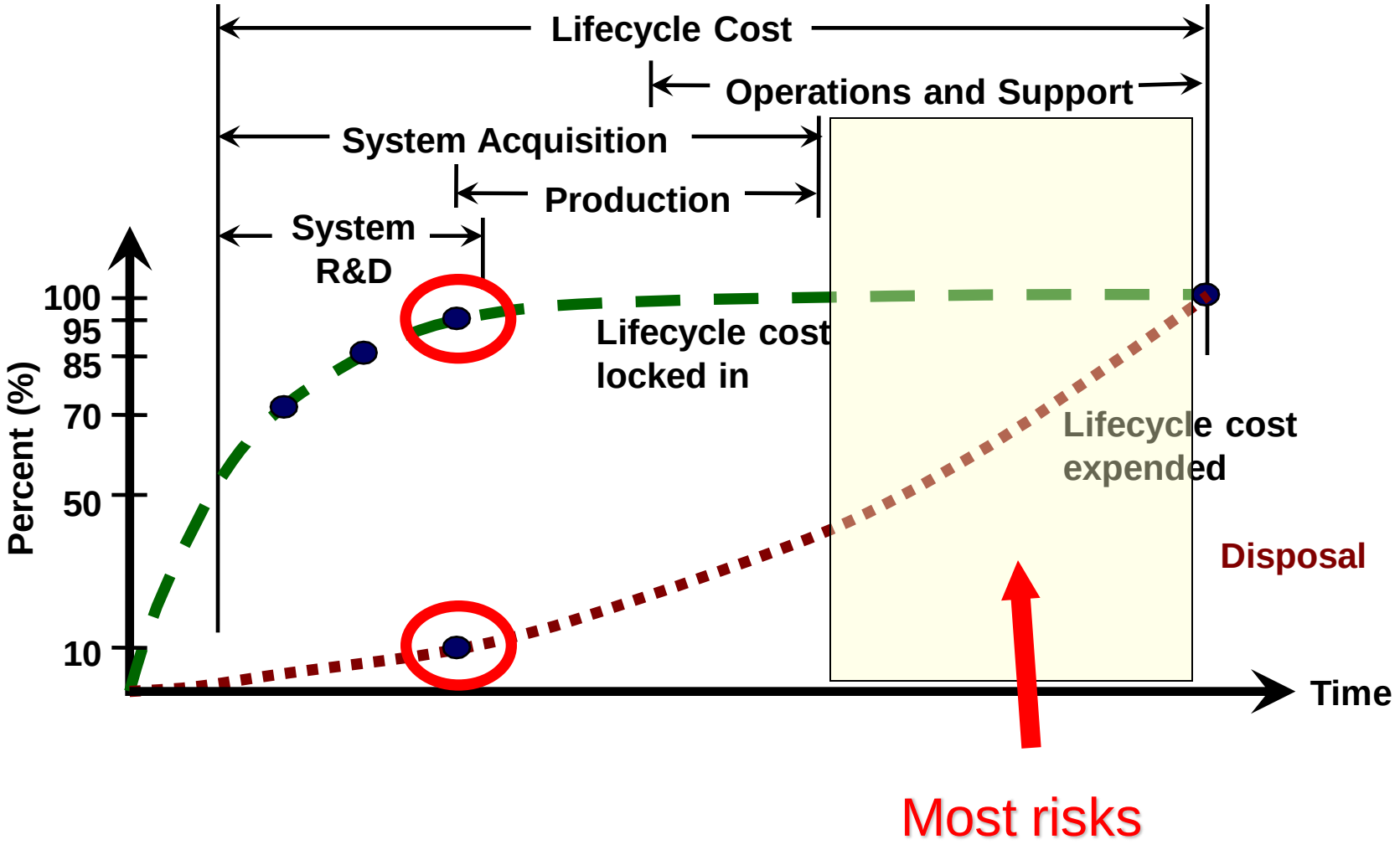
We can calculate this – Need to do better

95% of Life Cycle Cost Locked-In Early



From W. J. Larson & L. K. Pranke (1999) Human Spaceflight: Mission Analysis and Design

Most Risks After System Delivery

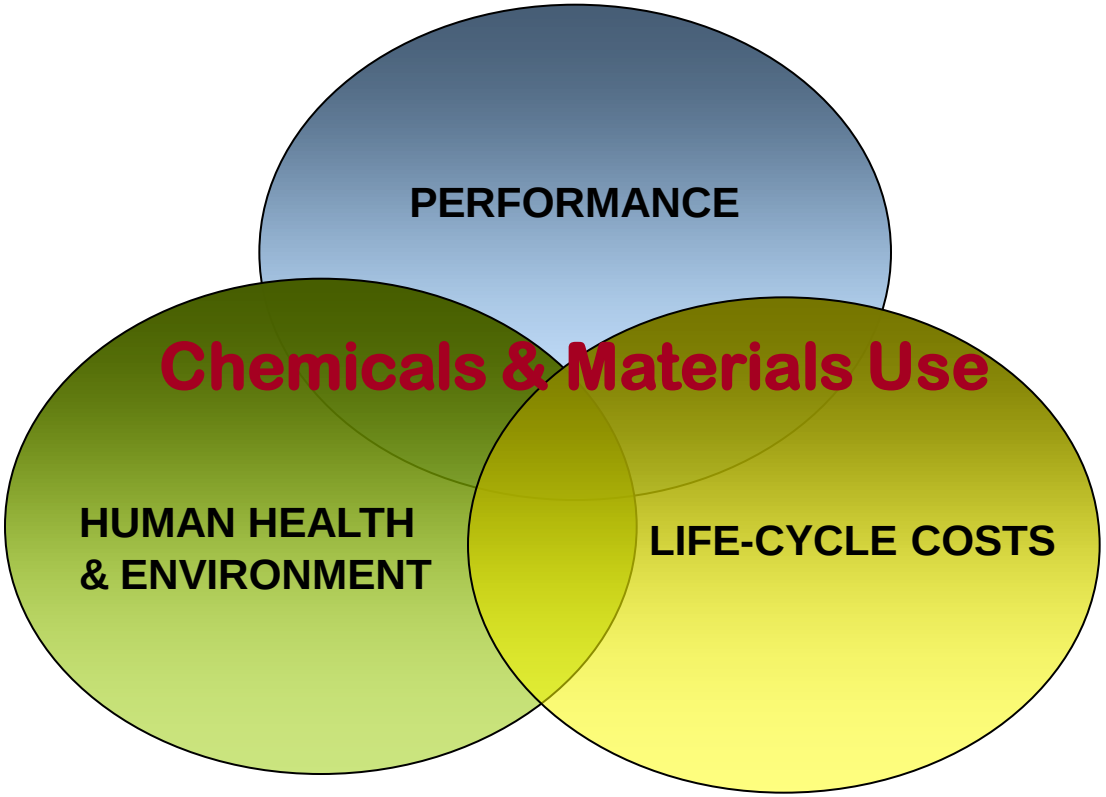


What is a significant risk driver throughout the life cycle of systems?

DoD Systems Sustainability

Cross-Cutting Risk & Cost Factor

Acquisition, Technology and Logistics



What's the Challenge?

- Increased performance & reliability of new weapon systems require new materials and chemicals.
- DoD lacks detailed guidance to determine <u>what data are needed & when</u> to asses & manage life-cycle risks

DoD Acquisition Policies

- **DoDD 5000.1 – The Defense Acquisition System (2007)**
  - "Safety shall be addressed throughout the acquisition process. Safety considerations include human (includes human/system interfaces), toxic/hazardous materials and substances, …"

- **DoDI 5000.2 – Operation of the Defense Acquisition System (2008)**
  - Programmatic Environmental and Occupational Health Evaluation (PESHE) is required….(at various milestones).
  - As part of risk management, the PM shall eliminate ESOH hazards where possible, and manage ESOH risks where hazards cannot be eliminated. … During system design, the PM shall document hazardous materials contained in the system and shall estimate and plan for the system's demilitarization and safe disposal.

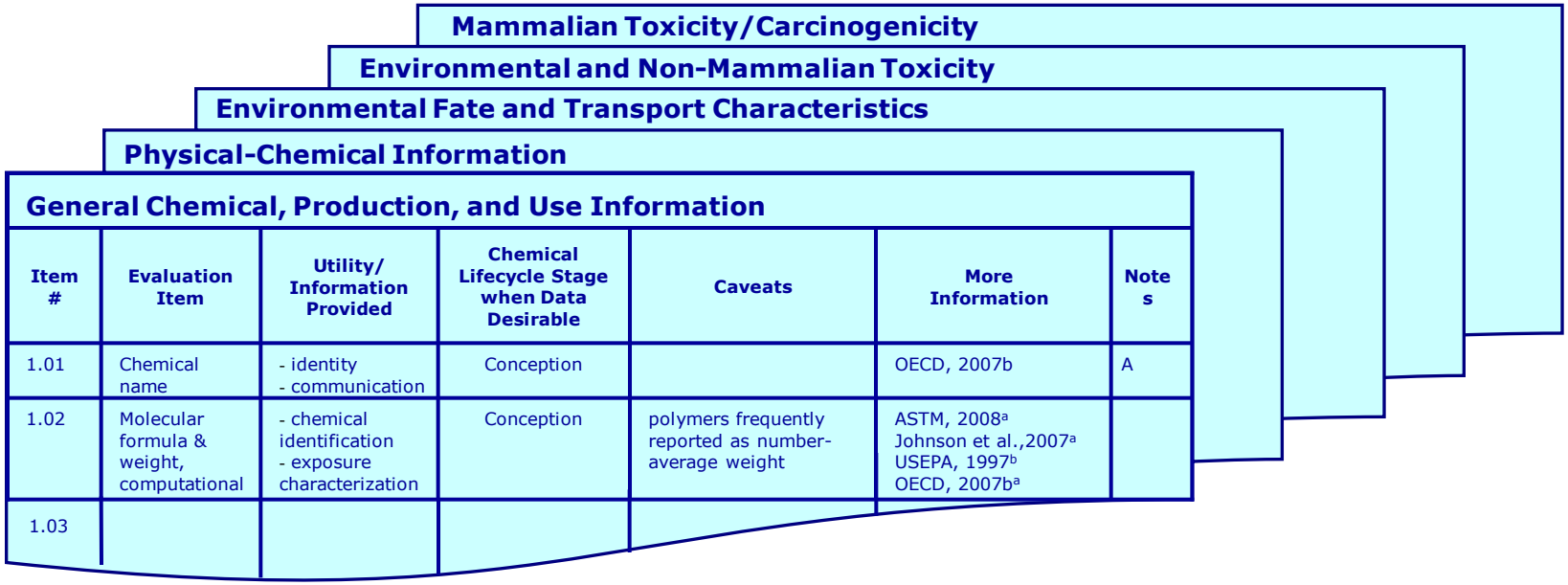
- **MIL-STD-882D, Ch 1 (draft)**
  - Eliminate or reduce risk through alternate designs and materials
  - Manage life cycle risk

But…what *specifically* do we need to know to assess & mange risks…

and when do we need to know it?

Answer: Physical, Chemical, & Toxicity Data Needs

- Five types of data displayed in standard Tables
- Data needs vary based on uses and predicted exposures
- Data can be used to better identify, assess, & mitigate risks



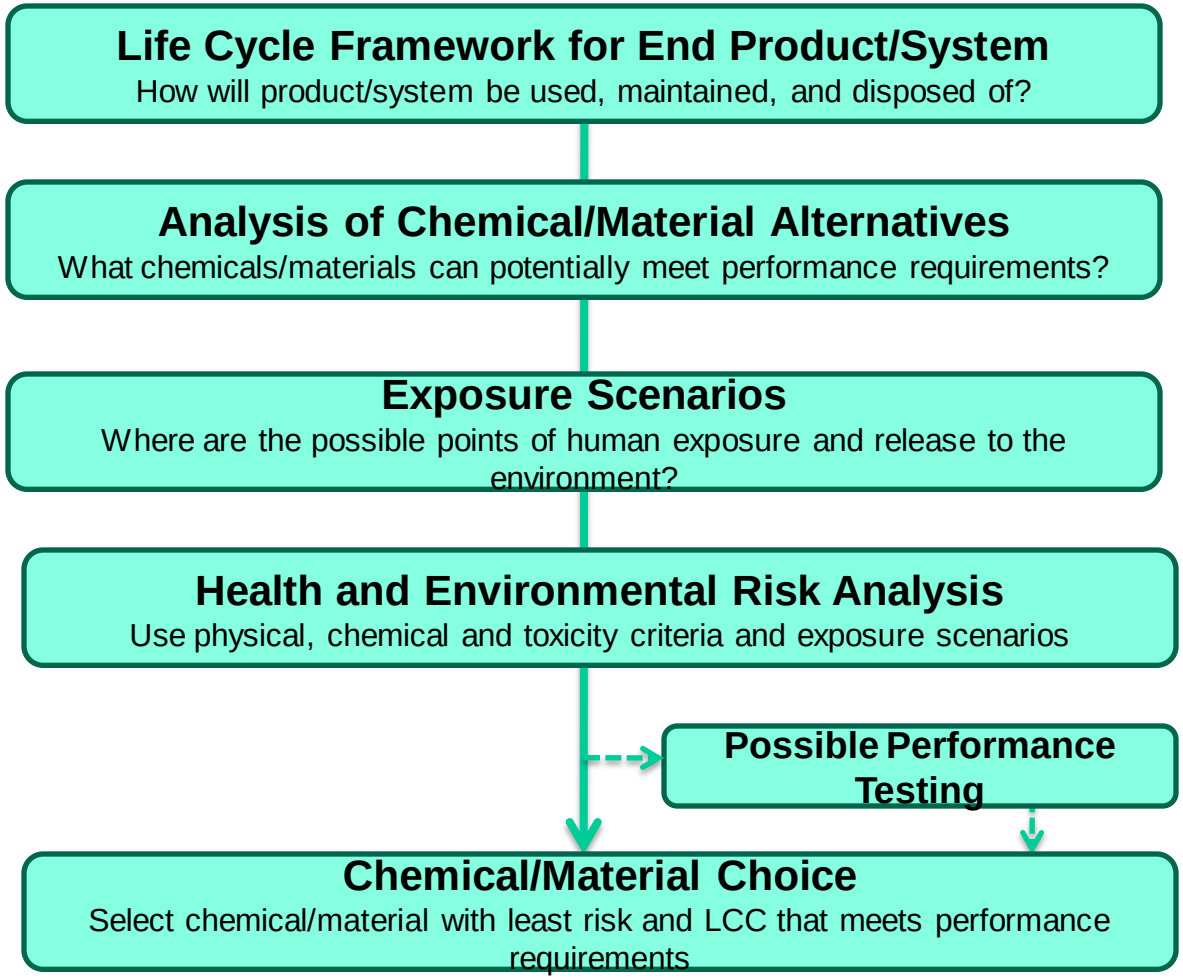
Item #	Evaluation Item	Utility/ Information Provided	Chemical Lifecycle Stage when Data Desirable	Caveats	More Information	Notes
1.01	Chemical name	- identity - communication	Conception		OECD, 2007b	A
1.02	Molecular formula & weight, computational	- chemical identification - exposure characterization	Conception	polymers frequently reported as number-average weight	ASTM, 2008[a] Johnson et al.,2007[a] USEPA, 1997[b] OECD, 2007b[a]	
1.03						

How do we integrate this into the DoD acquisition process??

Answer: Tie Data Needs to Life Cycle

- **Conception**
- **Synthesis**
- **Demonstration**
- **Production**
- **Operation & Maintenance**
- **Demilitarization & Disposal**

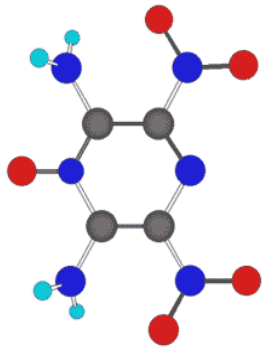
Making Wise Chemical/Material Choices



Next Steps

- **Convene a DoD steering group**
- **Develop a list of sustainability factors to be considered in the acquisition process**
  - **Possible weighting or scoring system to weigh alternatives**
- **Provide examples of the types of life cycle costs that need to be considered**
- **Develop "Sustainability in Acquisition" guidance or Military Standard for developers & program managers**
- **Develop training module**
  - **Defense Acquisition University**

Questions & Discussion



Extra Slides

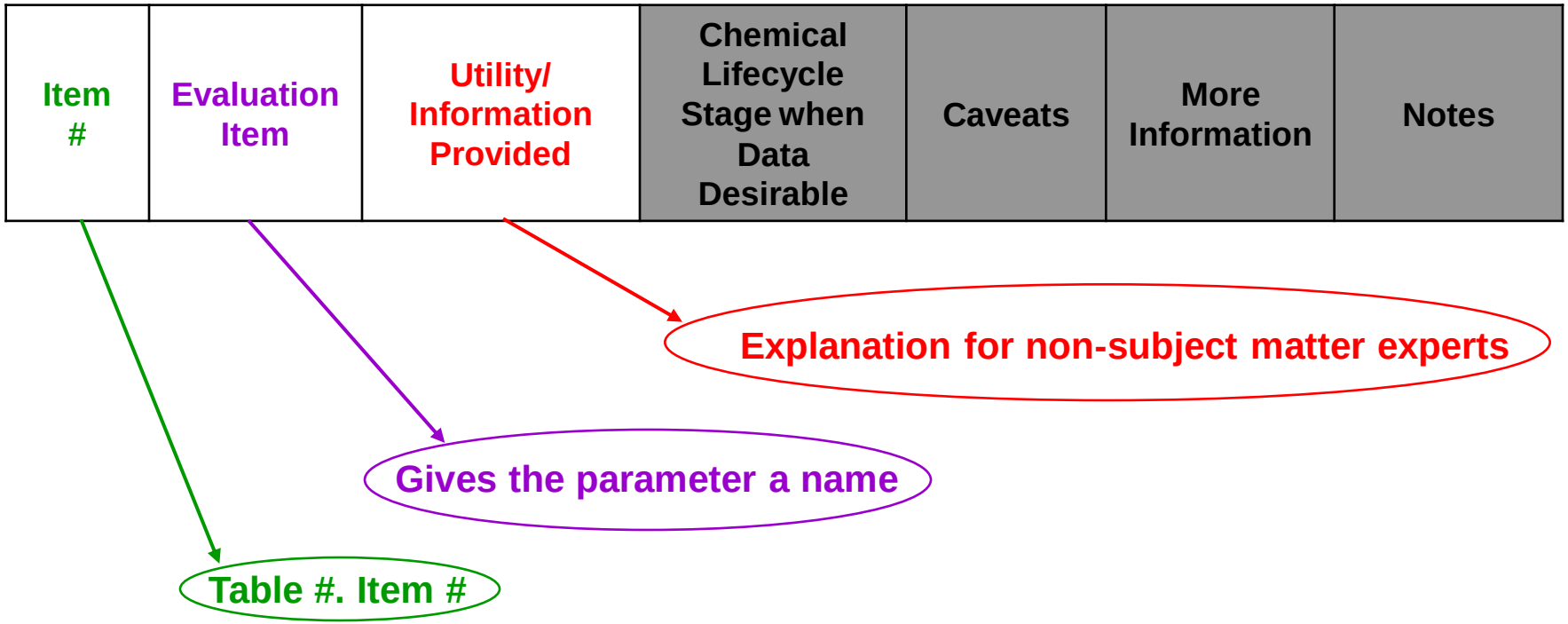
Chemical Evaluation Data Tables

Organization of the Data Tables

Item #	Evaluation Item	Utility/ Information Provided	Chemical Lifecycle Stage when Data Desirable	Caveats	More Information	Notes

Chemical Evaluation Data Tables

Organization of the Data Tables (cont.)



Chemical Evaluation Data Tables

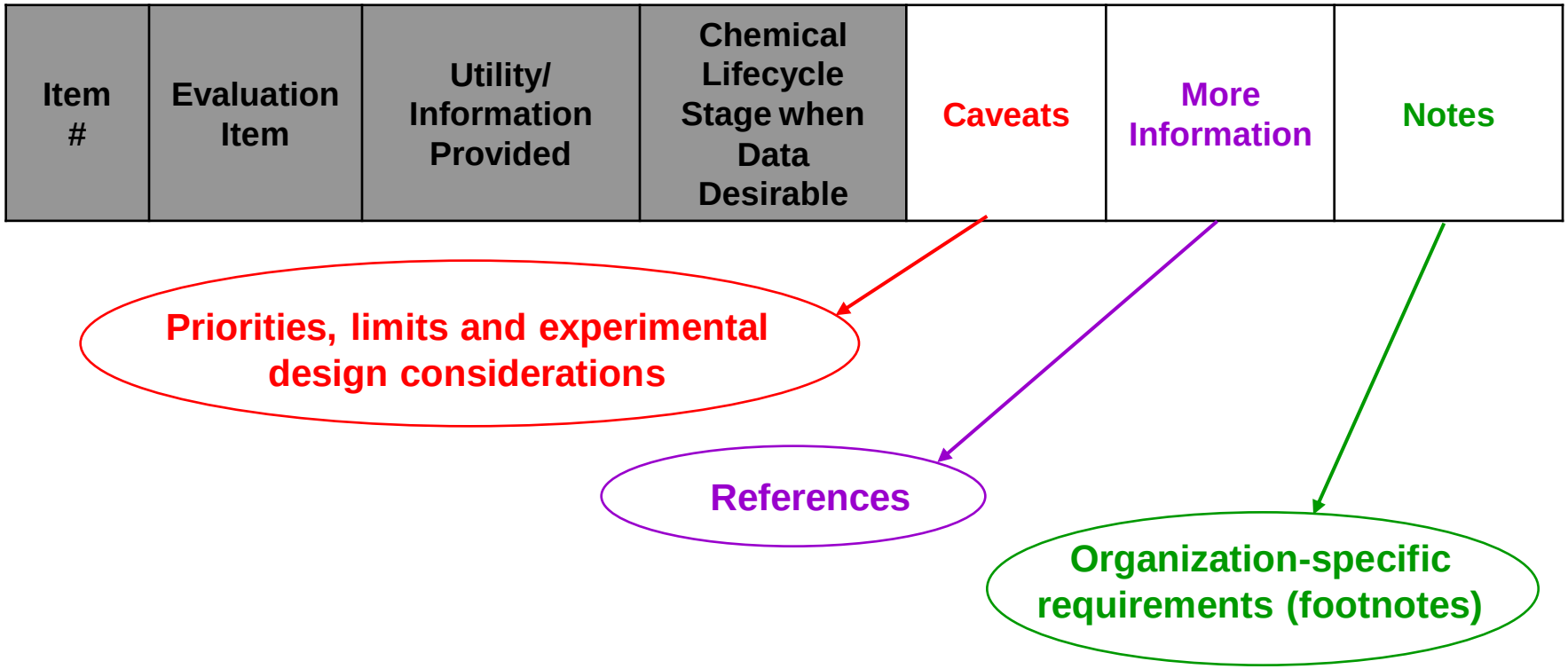
Organization of the Data Tables (cont.)

Item #	Evaluation Item	Utility/ Information Provided	Chemical Lifecycle Stage when Data Desirable	Caveats	More Information	Notes

- **Conception:** Molecular relationships and characteristics are evaluated to gain an understanding of the chemicals properties
- **Synthesis:** Production of chemical or material is demonstrated and perhaps optimized
- **Testing:** Chemical or material tried in the specific application or system configuration for which it was developed
- **Production:** Specific formulations established and mass production is planned

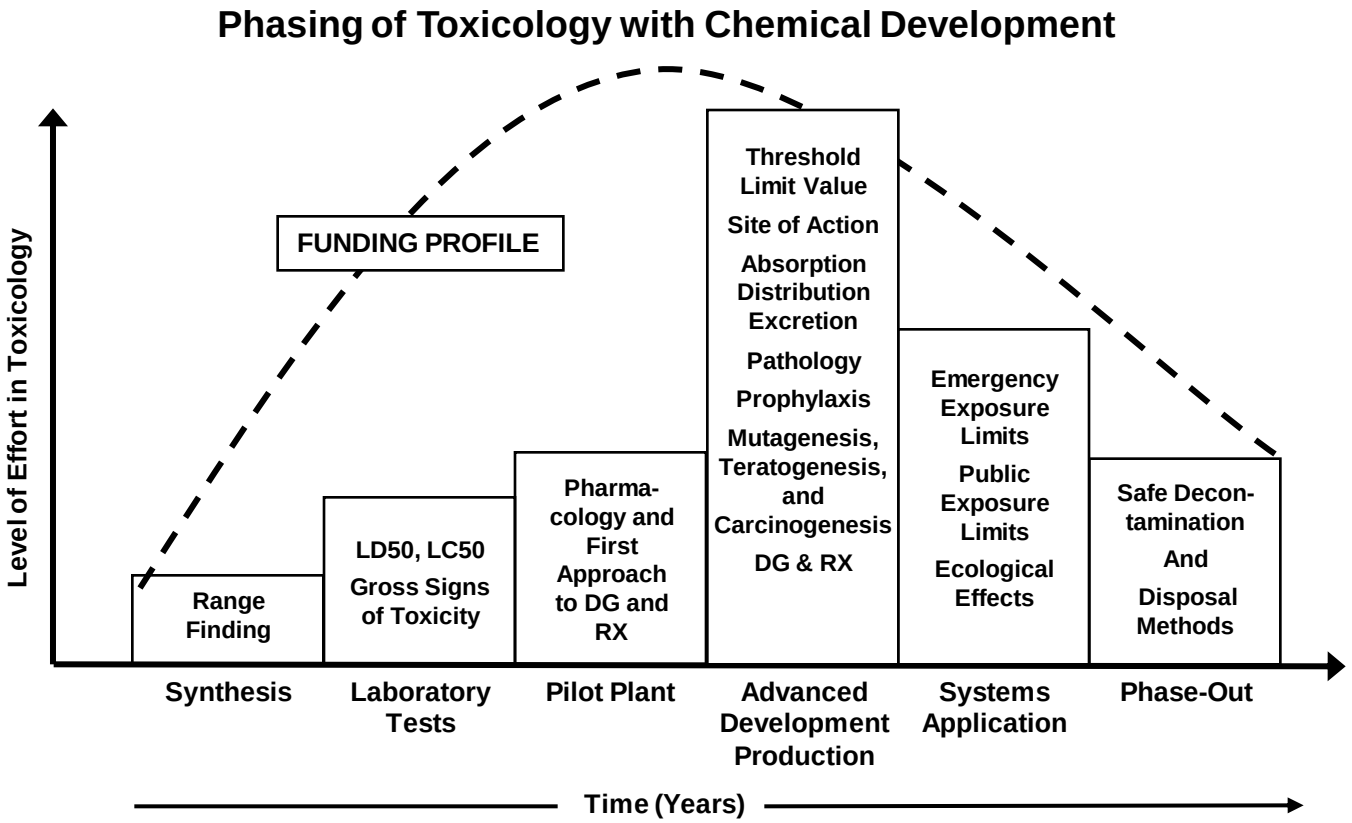
Chemical Evaluation Data Tables

Organization of the Data Tables (cont.)



Pioneering DoD Work

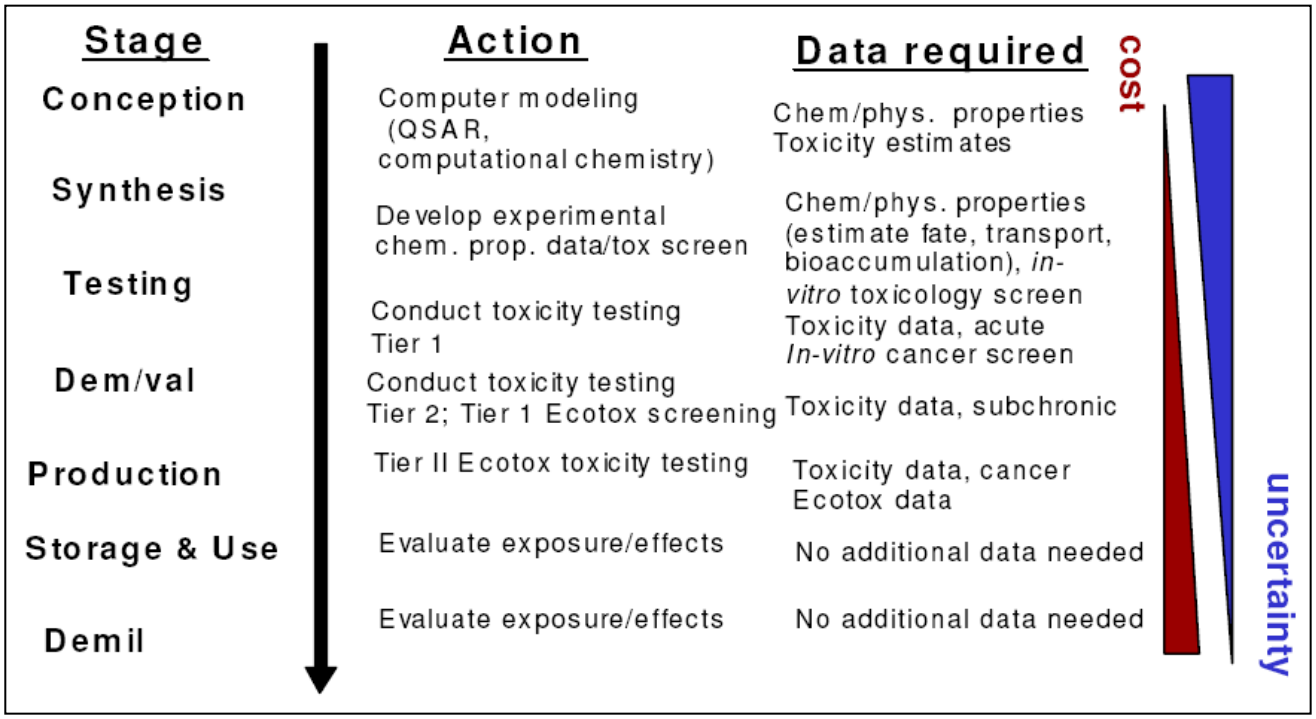
***The Impact on DoD of the Toxic Substances Control Act* (AF-AMRL*, 1980)**



* Air Force Aerospace Medical Research Laboratory

Pioneering DoD Work

***Assessing the Potential Environmental Consequences of a New Energetic Material: A Phased Approach* (USA-CHPPM 2007)**



General hierarchical approach to the development of environmental data (Johnson et al., 2007)